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(54) Title: E-COMMERCE TRANSACTIONS USING PRE-PAID PHONE SERVICE

(57) Abstract:

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## E-COMMERCE TRANSACTIONS USING PRE-PAID PHONE SERVICE

### BACKGROUND OF THE INVENTION

The present invention is directed toward e-commerce, and more  
5 particularly toward transacting e-commerce business using mobile communication  
units using pre-paid service.

E-commerce is a well known and fast growing part of today's economy.  
Transaction of business over the Internet is a convenient and usually inexpensive  
process for both businesses and customers. U.S. Patent No. 5,815,657 discloses  
10 a system which may be used for such transactions. The convenience factor has  
been increasing even further in recent years with the growing use of mobile  
communication units which function both as cellular telephones and terminals  
which may be used to access the Internet.

While security is provided in e-commerce transactions, many people are  
15 still understandably reluctant to transmit credit card information or the like as is  
necessary to conveniently complete a transaction, as they fear that the  
information may be intercepted and wrongly used, causing not only financial loss  
but great inconvenience to the potential customer. Such a concern is further  
magnified for people who may access e-commerce sites using a wireless mobile  
20 communication unit, as in that case such information is recognized by the user to  
be broadcast over the airwaves and therefore possibly intercepted by any  
sophisticated criminal in the area where the signal is sent.

The present invention is directed toward overcoming one or more of the  
problems set forth above.

## SUMMARY OF THE INVENTION

In one aspect of the invention, a mobile communication unit is used in a communication network to conduct e-commerce transactions. Funds are pre-paid to an account which is used to pay for use of the communication network by the mobile communication unit. A site of an e-commerce business on a computer network is contacted using the mobile communication unit, and then desired transactions at the e-commerce business site are identified. The mobile communication unit communicates authorization to the e-commerce business site to pay for the identified desired transactions using the pre-paid account, and the authorization is used to transfer funds from the pre-paid account to the e-commerce business.

In another aspect of the invention, a communication system for handling e-commerce transactions with an e-commerce business site is provided. A communication network communicates with a mobile communication unit and with the e-commerce business site to connect the mobile communication unit with the e-commerce business site. A pre-paid administration system handles a pre-paid account having pre-paid funds for paying for use of the communication network by the mobile communication unit, and communicates with the communication network. A transaction controller associated with the communication network controls communication via the communication network with the mobile communication unit, the e-commerce business site, and the pre-paid administration system. The transaction controller communicates an authorization to the e-commerce business site to pay for the identified desired transactions using the pre-paid account responsive to the authorization received via the

communication network from the mobile communication unit, and the pre-paid administration system transfers funds from the pre-paid account to the e-commerce business responsive to receipt of the authorization from the e-commerce business site.

5

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a sequence diagram illustrating an e-commerce transaction according to the present invention; and

Figure 2 is a schematic of a communication system incorporating the  
10 present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

Telecommunication networks today include infrastructure to provide mobile communication services to subscribers who prepay for such services. With such  
15 services, when the subscriber accesses the communication network, the network operator first validates that the pre-paid funds in the account (pre-paid account) of the subscriber to ensure that the subscriber has sufficient remaining pre-paid funds to pay for the requested use of the network. A pre-paid subscription database is maintained at a pre-paid administration system (PPAS) with  
20 information regarding the subscriber's state and the funds available for use, with the communication network accessing the PPAS to validate that the services should be provided to the subscriber. Standard protocols already exist for communication of the communication network with the PPAS. If the PPAS

indicates that the subscriber does not have sufficient remaining pre-paid funds for the requested service, the subscriber is notified and the services are not provided.

In accordance with the present invention as described in more detail below, the pre-paid funds and PPAS may be used by a subscriber to make e-commerce  
5 transactions over his mobile communication unit.

Specifically, as shown in the sequence diagram of Fig. 1, a subscriber 10 has pre-paid funds in an account which is used to pay for his mobile communication services with a mobile network 12 such as is known, with the account administered by a pre-paid administration system (PPAS) 14.

10 In accordance with suitable procedures such as are known, a pre-paid subscriber 10 initiates service with the mobile network 12, including transmitting identification information (e.g., the phone number and the mobile identity number [MINI]) about the mobile communication unit of the subscriber 10 to the network 12 with a query 20 for the balance available in the subscriber's account of  
15 pre-paid funds. In response to that query 20 from the subscriber 10, the mobile network 12 sends its own query 22 to the pre-paid administration system 14 identifying the type of service operation about to be provided and also identifying the subscriber (for example, by phone number) sufficiently to identify the subscriber's account for which information is maintained in the pre-paid  
20 subscription database at the PPAS 14.

The PPAS 14 checks the pre-paid subscription database and responds to the mobile network 12 with the requested information at 24. The mobile network 12 then responds to the pre-paid subscriber 10 at 26, typically indicating

to the subscriber 10 the balance of his pre-paid funds available and, assuming those funds are sufficient to pay for service, permitting service to continue.

It should be understood that while the above described set up procedures are essentially in accord with standards which have been used to date, variations  
5 on the set up procedures could be used within the scope of the present invention.

Thereafter, assuming that the mobile communication unit which the subscriber 10 is using is capable of providing Internet access, the subscriber may browse the Internet such as is also known. In accord with that, the subscriber 10 may submit a request 28 to the mobile network 12 to browse the Internet,  
10 commonly using a universal resource locator (URL) as the Internet addressing protocol. During initial browsing, this typically involves an initial request to go to the subscriber's home page, and such a request 34 for access to that home page is relayed from the mobile network 12 to the Internet 30, with the response of the home URL being relayed at 36 from the mobile network 12 to the subscriber 10 for  
15 display on his mobile communication unit. This may involve the provision of an encrypted transaction key and routing to the service control point (SCP), with the point of sale on the Internet 30 providing the same.

After such initiation of browsing, the subscriber 10 using the input device on his communication unit may communicate with the Internet 30 via the mobile  
20 network 12 to view different pages at different URL's of the Internet 30. In accordance with the present invention, an e-commerce business with which transactions may be made having a merchant URL may be contacted 40, 42, with that merchant URL displayed 44 on the mobile communication unit of the subscriber 10.

At reference numeral 46 in Fig. 1, the subscriber/user 10 may then browse the URL of the merchant to identify items which the subscriber 10 wishes to purchase from the merchant. As is commonly known, when items are identified while browsing the merchant URL, the merchant URL functioning as the point of sale can create a log of items which the subscriber 10 has identified to be purchased (commonly characterized as a "shopping cart"), and a transaction number can be created at the point of sale to identify that log of items.

When the subscriber 10 has completed shopping (*i.e.*, has identified all of the items which he wishes to purchase from the merchant URL, the subscriber 10 may then input on his mobile communication unit that he wishes to make the purchase (commonly characterized as "checking out"). "Check out" procedures are known in the art for e-commerce. However, in accord with the present invention, the merchant URL may include a check out option allowing payment to be made using a "User Pre-Paid Account". When the subscriber 10 selects that option as a part of "checking out", a request to purchase items using the pre-paid account is sent at 50 from the mobile communication unit to the mobile network 12, which in turn relays that information to the "point of sale", that is, the merchant URL on the Internet 30, together with information relating to the subscriber's pre-paid funds account administered by the pre-paid administration system 14. Such information may be sent from the mobile communication unit via the mobile network 12, or at indicated at 52 the mobile network 10 may itself have and/or verify the necessary information associated with the mobile communication unit of the subscriber 10 and append such information to the request received from the subscriber 10 before relaying the request (at 54) to the point of sale on

the Internet 30 with additional information related to the pre-paid account. In the latter case, the information need not have been transmitted in an over-the-air signal by the mobile network 12, thereby allaying security concerns which might arise from interception of such a signal. The additional information related to the pre-paid account is used by the point of sale on the Internet 30 to query for funds and to validate the PPAS 14 as a proxy.

Further, the necessary information for authorizing use of funds from the pre-paid account may be established whenever the mobile communication unit of the subscriber 10 contacts the mobile network 12 for authorized operation, and such information may be established as valid only during authorized operation of the mobile communication unit. For example, in a simple form, a different password or encrypted transaction key may be established with the pre-paid administration system 14 each time the mobile communication unit initiates authorized use of the mobile network 12, and when operation of the mobile communication unit ceases, the mobile network 12 may communicate with the pre-paid administration system 14 that the transaction key should no longer be honored. In this way, additional security is provided by authorizing use of the pre-paid account only when the subscriber 10 is using his mobile communication unit which is authorized to use that account.

The pre-paid account information is then at 56 used by the point of sale on the Internet 30 to query the pre-paid administration system 14, indicating essentially that a purchase authorization has been received for the particular pre-paid account. This may be accomplished in any suitable manner including, for example, use of well known SET/SSL protocols for Internet financial transactions



(SSL is a protocol/standard for securing data on the Internet which does so by encrypting at the browser and decrypting at the server, and SET is a protocol/standard which is often used for secure transactions that generally involves contact with a bank). If the authorization is proper (*i.e.*, if the  
5 authorization information received for the particular pre-paid account is valid and proper), the pre-paid administration system 14 confirms at 58 to the point of sale on the Internet 30 that the transaction may be completed and that sufficient funds in the pre-paid account have been designated for appropriate transfer to the point of sale on the internet 30, and such a transfer of funds may be made at that time  
10 or later in a batch transfer of funds.

The point of sale on the Internet may then at 60 also transmit information to the mobile network 12 indicating that the transaction was approved and other desired information (such as the transaction amount, the subscriber's balance of funds in the pre-paid account, a transaction identification number, etc.), with the  
15 mobile network 14 then relaying that information at 62 to the mobile communication unit, where it may be displayed for review by the subscriber 10 (it should be understood that it would be within the scope of the invention for the "display" of information at the mobile communication unit to involve an audio signal which speaks the information).

20 A communication system 100 with which the above described operation may be practiced is illustrated in Fig. 2.

The mobile network 12 of Fig. 1 is shown as a communication network 102 (*e.g.*, a cellular telephone network such as are well known) which provides communication with a plurality of mobile communication units or mobile

terminals 104, one of which is shown as a cellular telephone having a display 106. Data and voice transmission may be accomplished between the communication unit 104 and the communication network 102 in any suitable fashion, many of which are well known in the art. For example, CDMA ("Code-Division Multiple Access") and TDMA ("Time Division Multiple Access") systems are well known systems used for wireless cellular communication between base stations of a communication network 102 and multiple mobile telephones. However, it should be understood that the exact nature of the communication between the mobile communication unit 104 and the communication network 102 is unimportant to the present invention, as any communication standard which allows the transfer of information such as described herein may be used with the present invention.

The communication network 102 is linked to a computer network 110 such as the Internet (30 in Fig. 1) through which e-commerce transactions may be made. The computer network 110 will typically include a plurality of sites 112 for businesses which transact e-commerce (when a transaction takes place, the site 112 at which the transaction occurs is the "point of sale"). In the case of a mobile communication unit 104 being used to transact business with one of those sites 112, a communication link 120 between the communication network 102 and that site 112 is established such as previously described (it should be understood that while the one link 120 is shown for illustration purposes, there is not necessarily a direct link but instead a routing path available for use when information must be communicated, with routing paths available to any or all of the sites 112). Again, any protocol suitable for securely communicating the necessary

information between the communication network 102 and the e-commerce site 112 as previously described may be used within the scope of the invention.

The pre-paid administration system 14 is also linked both to the communication network 102 and the computer network 110, again for  
5 transmission of data as previously described. It should be understood that while the pre-paid administration system 14 is shown separate from the communication and computer networks 102, 110, it may be integral with or a part of either network, with the necessary communication links and security provided internally in such network 102, 110.

10 A transaction controller 130 is associated with the communication network 102 for controlling communication via the communication network 102 with the mobile communication unit 104, the e-commerce business site 112, and the pre-paid administration system 14. The invention is not limited, however, to a particular controller 130, and as with the exact nature of the communication  
15 standards and protocols used, any controller which will control communication of the necessary information such as described above in accordance with the present invention may be suitably used.

It should now be understood that the present invention will allow a pre-paid subscriber 10 to use funds which were set aside for phone usage for another  
20 purpose. This makes the funds more versatile to the subscriber 10, and may thereby cause the subscriber 10 to more readily commit more funds to a pre-paid account. Further, such potential uses may make such funds more attractive in cases where there is a time limit during which the funds must be used or lost, since they would allow the subscriber 10 the option of using his funds for other

purposes even if it turned out that his phone use was not as great as he anticipated when depositing money in the pre-paid account. Still further, it allows the subscriber 10 to transact e-commerce business with potentially a greater degree of anonymity for the subscriber 10 without having to give out additional  
5 information such as may be required with the use of a credit card, which information may be more easily used to identify the subscriber 10. Of course, this further allows those subscribers 10 who may not even have a credit card for some reason (e.g., through personal choice or as a result of bad credit) to conduct e-commerce.

10        Still other aspects, objects, and advantages of the present invention can be obtained from a study of the specification, the drawings, and the appended claims. It should be understood, however, that the present invention could be used in alternate forms where less than all of the objects and advantages of the present invention and preferred embodiment as described above would be obtained.

15

## CLAIMS

1. A method of using a mobile communication unit with a communication network to conduct e-commerce transactions, comprising:

5       prepaying funds to a pre-paid account, said communication network using funds from said pre-paid account to pay for use of said communication network by said mobile communication unit;

          contacting a site of an e-commerce business on a computer network using said mobile communication unit;

10       identifying desired transactions at said e-commerce business site using said mobile communication unit;

          using said mobile communication unit to communicate authorization to said e-commerce business site to pay for said identified desired transactions using said pre-paid account;

15       using said authorization to transfer funds from said pre-paid account to said e-commerce business.

2. The method of claim 1, wherein said pre-paid account is controlled  
20 by a pre-paid administration system, and further comprising:

          establishing a transaction key for said authorization to said e-commerce business site to pay for said identified desired transactions using said pre-paid account, said transaction key being communicated between said pre-paid administration system and said communication network;

said using said mobile communication unit to communicate authorization to said e-commerce business site to pay for said identified desired transactions using said pre-paid account comprises communicating said transaction key from said communication network to said e-commerce business site; and

5        said using said authorization to transfer funds from said pre-paid account to said e-commerce business comprises communicating said transaction key from said e-commerce business site to said pre-paid administration system.

10        3.        The method of claim 1, wherein said authorization terminates when said mobile communication unit stops communication via said communication network.

15        4.        The method of claim 1, wherein said using said mobile communication unit to communicate authorization to said e-commerce business site to pay for said identified desired transactions using said pre-paid account comprises:

20        communicating said identified desired transactions from said mobile communication unit to said communication network, and

      communicating said identified desired transactions from said communication network to said e-commerce business site.

5. The method of claim 1, wherein:

said pre-paid account is controlled by a pre-paid administration system,

and

said using said authorization to transfer funds from said pre-paid account

5 to said e-commerce business comprises:

communicating said identified desired transactions from said  
e-commerce business site to said pre-paid administration system, and

communicating completion of said identified desired transactions  
from said pre-paid administration system to said e-commerce business site.

10

6. The method of claim 1, wherein said mobile communication unit is a  
cellular telephone, said communication network is a cellular network, and said  
computer network is the Internet.

15

7. A communication system for handling e-commerce transactions with  
an e-commerce business site, comprising:

a communication network communicating with a mobile communication unit  
20 and with said e-commerce business site to connect said mobile communication  
unit with said e-commerce business site;

a pre-paid administration system handling a pre-paid account having  
pre-paid funds for paying for use of said communication network by said mobile

communication unit, said pre-paid administration system communicating with said communication network;

a transaction controller associated with said communication network for controlling communication via said communication network with said mobile communication unit, said e-commerce business site, and said pre-paid administration system;

wherein said transaction controller communicates an authorization to said e-commerce business site to pay for said identified desired transactions using said pre-paid account responsive to said authorization received via said communication network from said mobile communication unit, and said pre-paid administration system transfers funds from said pre-paid account to said e-commerce business responsive to receipt of said authorization from said e-commerce business site.

15

8. The communication system of claim 7, wherein said authorization includes a secure transaction key communicated between said mobile communication unit and said pre-paid administration system via said communication network.

20

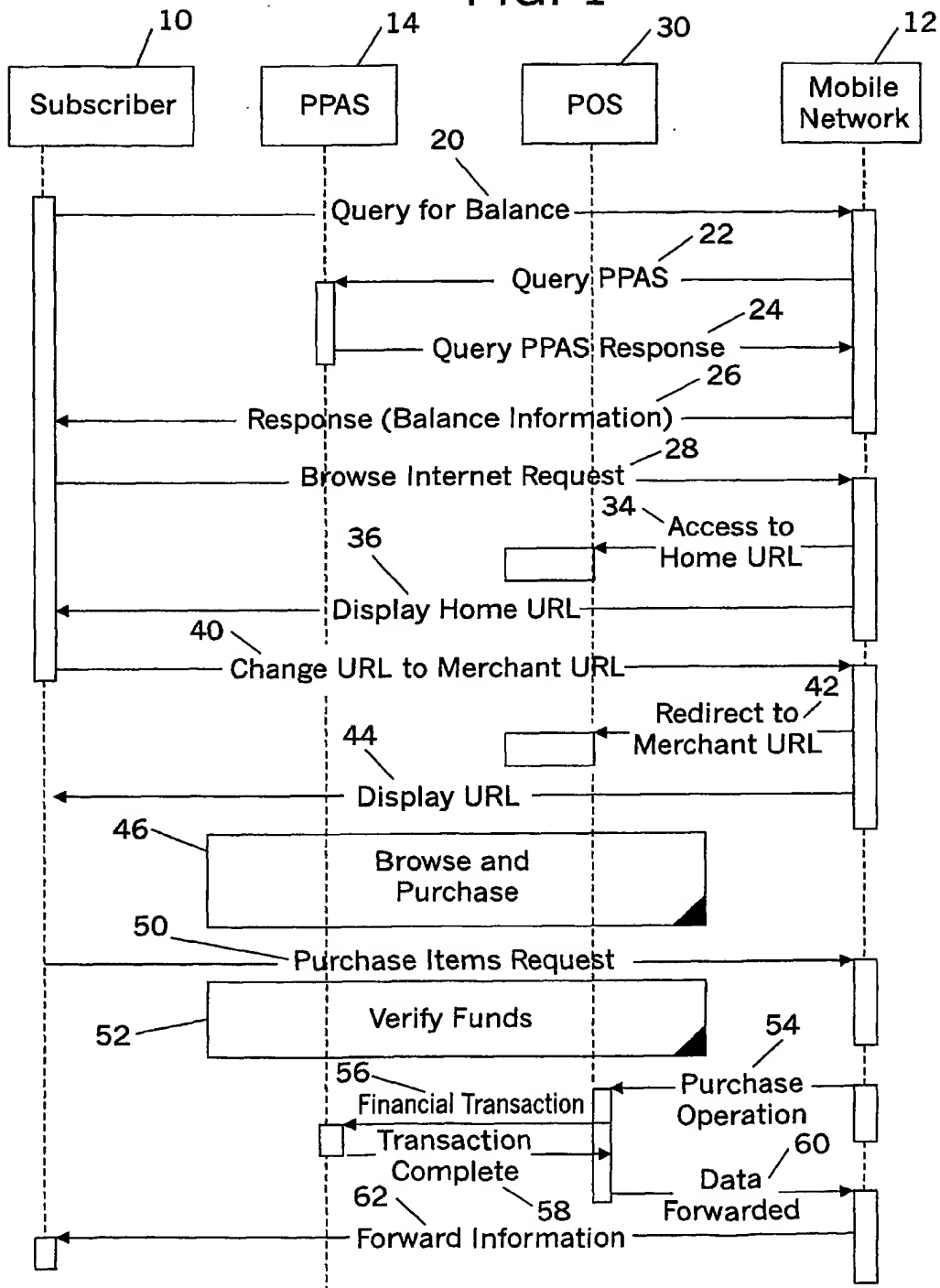
9. The communication system of claim 7, wherein said authorization is invalidated when said mobile communication unit stops communication via said communication system.



10. The communication system of claim 7, wherein said communication network is a cellular network, and said e-commerce business site is on the
- 5 Internet.

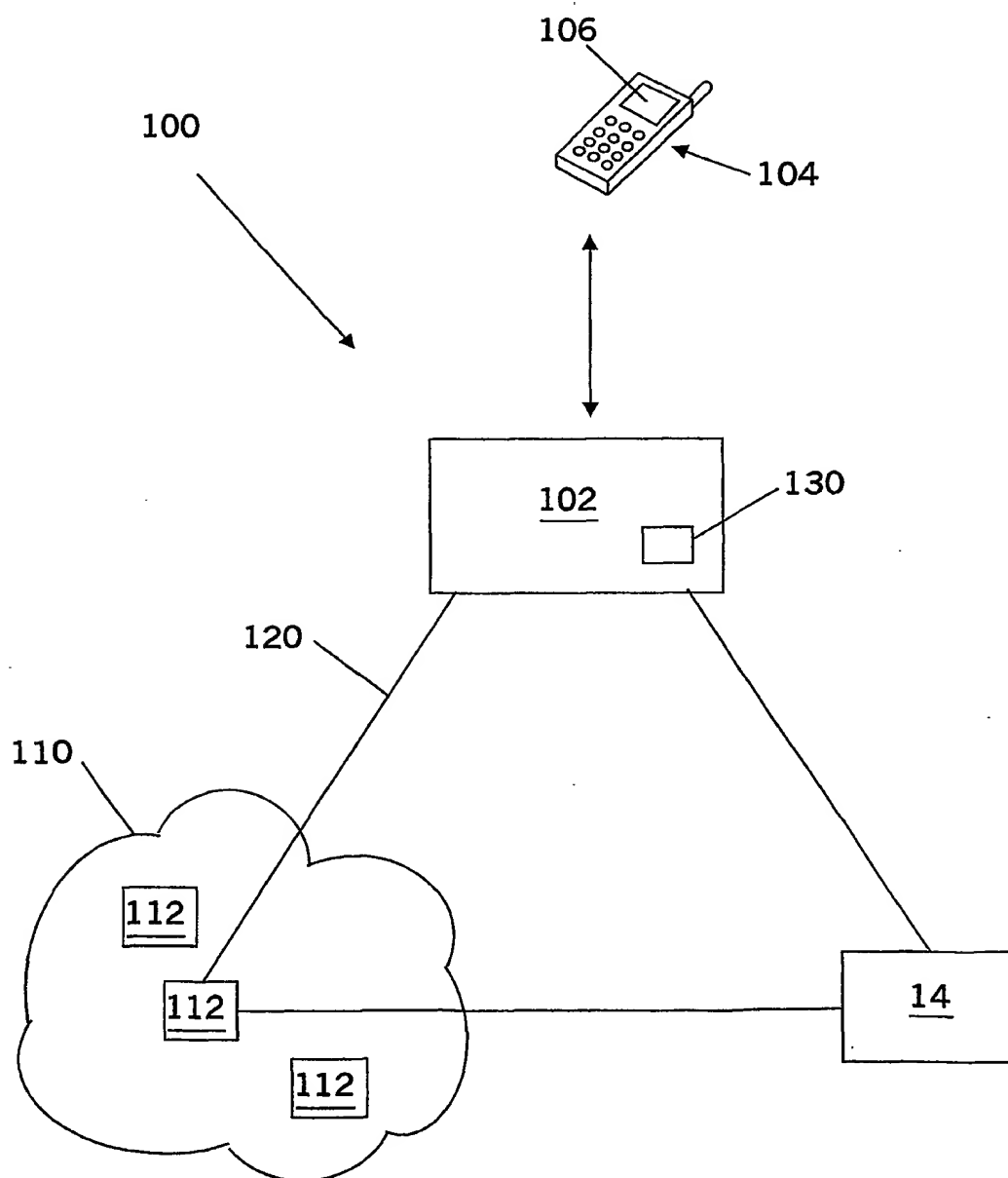
1/2

FIG. 1



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FIG. 2




## DECLARATION OF NON-ESTABLISHMENT OF INTERNATIONAL SEARCH REPORT

(PCT Article 17(2)(a), Rules 13ter.1(c) and Rule 39)

Applicant's or agent's file reference <b>P12466-W01</b>	IMPORTANT DECLARATION	Date of mailing(day/month/year) <b>22/01/2002</b>
International application No. <b>PCT/US 01/ 27153</b>	International filing date(day/month/year) <b>30/08/2001</b>	(Earliest) Priority date(day/month/year) <b>28/09/2000</b>
International Patent Classification (IPC) or both national classification and IPC		<b>G06F17/60</b>
Applicant <b>TELEFONAKTIEBOLAGET LM ERICSSON</b>		

This International Searching Authority hereby declares, according to Article 17(2)(a), that **no international search report will be established** on the international application for the reasons indicated below

1. ☒ The subject matter of the international application relates to:
- a. ☐ scientific theories.
  - b. ☐ mathematical theories
  - c. ☐ plant varieties.
  - d. ☐ animal varieties.
  - e. ☐ essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes.
  - f. ☒ schemes, rules or methods of doing business.
  - g. ☐ schemes, rules or methods of performing purely mental acts.
  - h. ☐ schemes, rules or methods of playing games.
  - i. ☐ methods for treatment of the human body by surgery or therapy.
  - j. ☐ methods for treatment of the animal body by surgery or therapy.
  - k. ☐ diagnostic methods practised on the human or animal body.
  - l. ☐ mere presentations of information.
  - m. ☐ computer programs for which this International Searching Authority is not equipped to search prior art.
2. ☐ The failure of the following parts of the international application to comply with prescribed requirements prevents a meaningful search from being carried out:
- ☐ the description      ☐ the claims      ☐ the drawings
3. ☐ The failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions prevents a meaningful search from being carried out:
- ☐ the written form has not been furnished or does not comply with the standard.
- ☐ the computer readable form has not been furnished or does not comply with the standard.
4. Further comments:

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer
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## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 203

The claims relate to subject matter for which no search is required according to Rule 39 PCT. Given that the claims are formulated in terms of such subject matter or merely specify commonplace features relating to its technological implementation, the search examiner could not establish any technical problem which might potentially have required an inventive step to overcome. Hence it was not possible to carry out a meaningful search into the state of the art (Art. 17(2)(a)(i) and (ii) PCT; see Guidelines Part B Chapter VIII, 1-6).

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.